

عنوان مقاله:

Melting Heat Transfer Analysis on Magnetohydrodynamics Buoyancy Convection in an Enclosure: A Numerical Study

محل انتشار:

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تعداد صفحات اصل مقاله: 11

نویسندگان:

K. Venkatadri - *Department of Mathematics, VEMU Institute of Technology, P. Kothakota, India*

Shaik Abdul Gaffar - *Department of Information Technology, Mathematics Section, Salalah College of Technology, Salalah, Oman*

M. Suryanarayana Reddy - *Department of Mathematics, JNTUA College of Engineering, Pulivendula, India*

V. Ramachandra Prasad - *Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, India*

خلاصه مقاله:

The roll of melting heat transfer on magnetohydrodynamic natural convection in a square enclosure with heating of bottom wall is examined numerically in this article. The dimensionless governing partial differential equations are transformed into vorticity and stream function formulation and then solved using the finite difference method (FDM). The effects of thermal Rayleigh number (Ra), melting parameter (M) and Hartmann number (Ha) are graphically illustrated. As melting parameter and Rayleigh number increase, the rate of fluid flow and temperature gradients also increase. And in the presence of magnetic field, the temperature gradient reduces and hence, the conduction mechanism is dominated for larger Ha . Greater heat transfer rate is observed in the case of uniform heating compared with non-uniform case. The average Nusselt number reduces with increasing magnetic parameter in the both cases of heating of bottom wall.

کلمات کلیدی:

Natural convection, Square enclosure, Finite difference method, Incompressible flow, Melting heat transfer

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